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Peasant-managed Agricultural Growth in China: Mechanisms of Labour-driven Intensification

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Abstract. This article discusses the different mechanisms that sustain labour-driven intensification in contemporary Chinese agriculture. They include: labour investments directed at improving resources; the intensification of cropping schemes; fine-tuning production processes, resulting in yield increases; embedded specialization; the reorganization of space; and on-farm processing, which gives more value-added per unit of end product. These mechanisms help to enlarge the autonomy of peasant families and their units of production. They simultaneously help to improve incomes. The article pays special attention to migrant labour and the way it helps to enlarge investments and spur the intensification of agricultural production.

Introduction

Over the last two decades much attention has been given to the processes of industrial development and urbanization taking place at a rapid, if not unprecedented, pace and thus radically transforming Chinese society. In this context, the agricultural sector is easily perceived as a 'stagnating sector' that urgently needs a shift towards large-scale, industrialized farming. The more since labour migration (from the countryside to industrial centres) seems to result in 'empty nest villages' or 'hollow villages' (Peng, 2007; Yang and Liu, 2009) where only women, the elderly and young children remain.[1] The urbanization and industrialization of a nation seems to provoke once again the 'demise of the rural economy' (Gudeman, 1978).

In this article we argue that such a representation of rural China is mistaken. Many rural villages in China have vibrant economies – not despite but due to (temporary) migration. This is because the structure of China's rural economy is resulting in a process of agricultural growth[2] that is, from several points of view, as startling as the process of industrial growth.

Basically, Chinese agriculture is a peasant agriculture and its agricultural growth is a peasant-managed process: it is rooted in the decisions of 250 million peasant households on what to produce, by whom, how, and for what reasons. Such decisions are taken in a contextual setting in which markets, policies, technological op-

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portunities, ecosystems, gender relations, local and regional power relations and cultural repertoires all play important (and sometimes contradictory) roles. However, these contextual elements do not intervene in the places of production in a deterministic and non-mediated way: they are always subject to peasants' decisions about what is relevant or not, and if deemed relevant they are actively interpreted and translated into specific courses of action.

Peasant-managed agricultural growth occurs mainly as labour-driven intensification. It is a process that results in steady increases in yields, i.e. the level of production realized per object of labour (land, animals, fruit trees, etc.) is augmented – the more value produced per object of labour, the more intensive production is. Labour-driven means that both quantity and quality of (peasant) labour are crucial in driving forward this process of intensification. It is the opposite of technology-driven intensification, which often translates into a considerable reduction of the quantity of labour applied and into deskilling when it comes to the quality of labour. Of course, both processes assume the presence of labour and of technology. In labour-driven intensification, however, skill-oriented technologies characterize the process of agricultural production. Technology-driven intensification production is characterized by mechanical technologies (Bray, 1986).

In this article we will discuss several mechanisms that play a role in, and explain, the remarkable growth of China's agriculture. The empirical data were gathered between 2008 and 2012, in two mountain villages (Sanggang and Yuangang) located in the south-western part of Hebei Province. The authors have thorough knowledge of these villages and the surrounding area through participation in a long-term research programme.

Labour Investments: Improving the Quality of Available Resources

The image entailed in Figure 1 might be quite enigmatic for outsiders. In Sanggang village, though, it is a self-evident part of daily life. It shows two peasant farmers digging mud out of a drainage canal that crosses the village. At the bottom of this canal a lot of detritus has accumulated that washed from the streets during the rainy season. This highly fertile mud is loaded into a small three-wheeled truck and then brought to the fields in order to improve the structure and fertility of the soil. In more general terms, the picture shows the improvement of the resource base (i.e. the fields) through the investment of labour. The improvement is not acquired through the market – it is realized directly by way of the peasants' own labour.[3] An important consequence of this is that the improvement of the structure and fertility of the soil is not 'paid for', other than with the peasants' labour. It does not represent a financial burden that needs to be recouped later on, it has already been paid for: it is the result of the labour invested in it. It guarantees that benefits (a better harvest) are expected. The better harvest benefits the peasant family directly. There is no need to pay a bill.

The history of peasant agriculture is largely the history of labour investments. Through such investments (in improved soil fertility, terraces, buildings, fences, irrigation canals, drainage systems, anti-erosion protection, levelling, mills, greenhouses, improved breeds, enlarged herds, etc.) peasants enlarge the value of their resource base. This allows for the introduction of more intensive cropping schemes (see Table 1) as well as for increases in yields (see Table 2). Several studies have documented that the value per unit of land of such labour investments (when expressed in monetary terms) often greatly exceeds the corresponding value of capital

Figure 1. Labour investment.

investments of large agricultural enterprises (e.g. CIDA, 1973; Netting, 1993; Van der Ploeg, 2008).

The increased value of the resource base is often discussed as an increase in capital. Improving the land is thus presented as part of capital formation. As such this interpretation is not wrong: the value of the available agroecological capital is increased, as is the value of the available economic capital. However, it is important to specify that we are not talking here about capital in the Marxist sense. There is no capital here that needs to produce surplus value to accumulate in order to be invested again as capital. We are dealing here with other values. The mud, once taken out of the canal and loaded onto the truck, acquires value as a fertilizer. Once applied, this fertilizer increases the fertility, and thus the value of land. This allows for other values to emerge: a better harvest and more well-being for the peasant family. Mud is converted into fertilizer. This fertilizer is converted into more fertile land which then, in its turn, is converted into higher yields (and/or more intensive cropping schemes). These conversions are non-monetary; they do not pass through the markets. They depend on labour. They are not capital investments – they are *labour investments*. Consequently, the 'return on investment' is not an amount of money on top of the initial investment. The investment does not imply money, and the 'return' is not expressed in monetary terms. Both investment and return occur within and through non-commodity circuits.

Obtaining New Resources through Labour Investments

Labour investments are not necessarily located within the farm. A decisive feature of current Chinese agriculture is that a considerable part of the labour investments takes place in economic activities (industry, construction, mining, trade, services) located *elsewhere*. These activities contribute to capital formation *within* the farm and thus to further intensification. The three-wheeled tractor in Figure 1 is a good illustration of this: it is present on the farm because it has been bought with earnings

obtained on a faraway construction site. Thus migrant labour is converted into a labour investment (at least partly) because it contributes to capital formation *within* the farm (Mohapatra et al., 2006; Zhang et al., 2006; Van der Ploeg and Ye, 2010).

The basic pattern is as follows. Young people leave the village and work for several years in industry or construction. This results in remittances and savings that are used in e.g. the building of a house (in rural villages the house is not only a place for living, it is also an important and indispensable resource for farming)[4] or the acquisition of a small three-wheeled vehicle. This vehicle is used not only for operations on the farm, but also for transporting stones from quarries (in neighbouring mountains) to the iron-ore factory in the village (Ye et al., 2009). The savings thus obtained might be used subsequently to acquire a larger lorry that allows for heavier transportation and increased earnings. These increased earnings are then used to pay for the construction of 'ditches' (discussed below) that will allow for the planting of walnut trees. In the meantime, it is quite probable that the wife of the owner of the lorry is cooking for the people who are working in the iron-ore factory. The cooking may provide an income of 700 yuan per month. It is used to buy a cow and to build, together with one of the neighbours, a small stable. Apart from the agricultural work in the fields and the cooking, the wife of the owner is now also alternating with her neighbour in herding their cows. The calves will be used to increase the small herd. This is the story behind Figure 2. The wife is herding the cows (along the small river), the husband passes on the road in his truck. The two are not engaged in meaningless routines: they are building a livelihood, in a knowledgeable and goal-oriented way. Resources are strategic in this livelihood (a house, the cows, the lorry, walnut trees) and *they are created through labour investments*.

The pattern clearly implies money, although it is not 'all-purpose money'. The major decisions are not driven by the search for the highest possible profit. The money is earned with a specific aim: it is to be converted into e.g. a three-wheeled tractor and nothing else. We are dealing here with *socially defined* conversion processes. The role of money is subordinated to the socially defined strategy. Non-commodity

Figure 2. Husband and wife involved in indirect labour investments.

considerations govern the use of this money. The operation of such strategies (and the resulting creation of 'capital goods') occurs, more often than not, through social networks (Yong and Van der Ploeg, 2009).

Intensifying Cropping Schemes

Even though they only have access to very little arable land, which is scattered across many small plots, the peasant families of Sanggang village cultivate an extensive range of crops. These include cotton, soybeans, peanuts, maize, sweet potatoes, millet, cabbages, many different vegetables and herbs, sesame, tree seedlings, etc. Alongside these crops there are several different fruit trees and animals including hogs, cows, chickens, goats and sheep. This 'package' does not remain fixed over time. Some crops, such as wheat, have disappeared, while others, such as chestnut trees and prunes, have been introduced anew.

Crops differ in yield and price. Consequently, the gross value of production (GVP) per unit of land might differ considerably.[5] Maize, for instance, renders a GVP of 560–700 yuan per mu[6] and cotton (including the oil) might result in 1,870 yuan per mu (2010 prices). When different crops are compared, the ones rendering a high GVP per mu are referred to as 'intensive crops'. Crops with a low GVP per mu are defined as 'extensive crops'. Intensive crops normally require more resources: more labour input per unit of land, more mechanization, more inputs, more irrigation water, etc. For the extensive crops it works the other way around.

The notion of a cropping scheme describes the particular combination of crops within the farm. Cropping schemes might become more intensive, in which case the relative weight of intensive crops is high. When cropping schemes are moving towards more intensive crops we can talk about an intensification of the cropping scheme.

The intensification of cropping schemes can be attractive to farmers: it means that they obtain more money and improve their incomes. It will also be attractive for a country as a whole: the intensification of cropping schemes implies an increase in the total wealth produced. However, the crucial question is always whether farmers have the means and the space to intensify and whether there is an acceptable balance between the required means and the obtained benefits.[7] Intensification of cropping schemes can occur at different levels: within the fields, at the level of a farm unit as a whole, and at the level of a village as a whole.

Table 1 presents on overview of the main changes in the cropping patterns at village level. Relatively extensive crops (such as wheat) have been eliminated from the cropping scheme – in large part because it requires considerable amounts of irrigation water, which is becoming increasingly scarce in Sanggang. Villagers now obtain the wheat flour they need through barter: 72 jin of maize is exchanged for 50 jin of wheat flour.[8] Another highly important element has been the elimination of animal traction, which is replaced by mechanical traction. Thus fodder no longer needs to be produced for donkeys or oxen: this creates space for more intensive crops.[9]

Yield Increases: Producing More per Single Crop

Once a cropping scheme is more or less defined, further intensification is possible through yield increases for each single crop. This implies that per crop more produc-

tion per unit of land is realized. Table 2 summarizes the impressive results that have been realized in Sanggang (as in the rest of the country). Maximum yield levels (here using maize as an illustration) are often considerably beyond the average levels. This points to room for further improvements.[10]

Intensification of this type is equally attractive to farmers; it implies that the available resources are used in a more efficient way, thus generating more wealth. But achieving yield increases requires considerable efforts. Soil fertility needs to be improved, more promising varieties must be selected, irrigation needs improving and cultivation fine-tuning. Development of the appropriate practical knowledge is an important prerequisite in achieving all this. Experimentation and the exchange of knowledge often play a strategic role in this respect.

Since the late 1970s Sanggang village has realized a process of intensification based fundamentally on the mechanisms discussed above. We refer to this process as peasant-managed agricultural development. Evidently, new varieties (often developed through scientific research), the availability of new technologies and increased input use also played important, sometimes even decisive roles. However, it is the peasants themselves who have acquired and combined these new artefacts to produce effectively (Ye et al., 2010).

The defining characteristic of peasant-driven intensification is its dependence on the quantity and quality of labour (as opposed to forms of intensification that depend on specific technologies and inputs). The labour input per unit of land is increased, whilst skills and knowledge (the 'quality of labour') are improved and increased. When skill-oriented technologies are central to the labour process (Bray, 1986), the development of skills and knowledge translates into higher yields. Fine-tuning is often a keyword here: through the meticulous coordination of a wide range of growth factors, higher levels of production are reached and sustained. Another defining characteristic of peasant-driven intensification is that it strengthens the relative autonomy of the farm (again this is different from technology-driven intensification, which tends to introduce and strengthen dependency relations).

Table 1. Main changes in cropping schemes in Sanggang village.

a. Elimination of wheat cultivation.
b. Introduction of fruit trees.
c. Elimination of animal traction.
d. Increase in vegetable production.
e. Increase in animal production (goats, chicken, hogs).
f. Forestation.

Note: Behind these changes lie complex spatial reorganizations. Forestation takes place partly in the valley but mostly in the hills. The introduction of fruit trees is currently taking place in the hills. The increase of vegetable production implies that the ratio between gardens and fields has changed.

Table 2. Yield increases in Sanggang village over the last 40 years.

Crop	1966–1974	2007–2009	Growth	Maximum
Maize	300–400	800–1,000	+100%	1,200
Peanuts	200	200–300	+25%	
Wheat	200	n/a		
Sweet potatoes	2,000	3,000	+50%	
Soybeans	200	350–400	>75%	

Alongside the mechanisms discussed thus far, new mechanisms are taking shape. These will, we believe, help to further strengthen the process of labour-driven intensification and thus contribute to food security in China, whilst simultaneously changing the *form*, but not the *nature*, of this process.

Embedded Specialization[11]

The Wu family (see Figure 3) currently works 10 mu of land, which is all planted with prunes. In total there are a little over 500 productive trees, which have already been producing for three to four years. Good trees might yield up to 100 jin of prunes. Last year's harvest totalled 50 000 jin (i.e. 25 000 kg of prunes). Prices fluctuate between 0.80 and 1.00 yuan per jin. This makes for a GVP/mu that fluctuates between 4,000 and 5,000 yuan/mu/year, far higher than the average yield of some 600 to 1,800 yuan/mu realized by the average peasant holding.[12] Thus, the Wu farm is a clear exponent of ongoing processes of intensification.[13]

At first sight this farm appears to be completely different from the average peasant holding in the valley, which is highly diversified and oriented to household consumption – only surpluses are sold on the market. Instead, this prune-producing farm is highly specialized and all its produce is marketed. A more careful look seems to affirm that the holding of the Wu family is indeed different – especially in as far as it goes beyond the limited scale of the average peasant holding. At the same time, though, it is still very much a peasant unit of production. It is managed according to the same strategic principles (and interrelations) that underlie the much smaller units:

- It has been constructed in a step-by-step way through labour investments, as discussed above.[14]
- It is combined with production for household consumption (located elsewhere).[15]

Figure 3. Specialization within the framework of the peasant farm.

- The direct producers are not aiming at further expansion, at accumulation; their productive activities are embedded in, and limited by, a wider socio-cultural framework.[16]
- Reciprocity is strategic in many respects.[17]
- Risk avoidance is considerable.[18]
- Employed labour is family labour (the main exception being the work done during the harvest).[19]

Taken together this implies that the plum orchard of the Wu family is based on a solid, autonomous and historical resource base. It gives them 'dignity and pride': it is an expression of the conversion (step by step) of the hard work into this orchard and its productive capacity. It does not represent dependency relations; it is, instead, a considerable asset that helps them to face and to overcome potential dependency relations. It is, in short, a vehicle for independence and autonomy.

This autonomy is, of course, a *relative* autonomy. It is an autonomous resource base, but in order to produce the Wus have to engage in more or less permanent commodity relations for the supply of some crucial inputs. Annually, they pay from 6,000 to 7,000 yuan for fertilizer, pesticides and electricity for operating the pump in their well. Compared to the overall sales of 40 000–50 000 yuan this is relatively modest (discussed in Yong and Van der Ploeg, 2009).

It is important here to note that there are other, more general conditions that have also been helpful in creating this intensive plum orchard.

- The availability of good access roads (without these the marketing of the prunes would be almost impossible) and the availability of electricity. Both these conditions highlight the role of the state in the overall process of ongoing agrarian development.
- The availability and communication of farmers' knowledge as well as scientific support.
- The possibility of travel, to meet other people involved in promising activities.
- The role of the Village Committee in the (re-)distribution of land.
- The existence of a strong social fabric in the village that allows for cooperation and reciprocity.

Another form of embedded specialization can be found with regard to livestock. Over the last three years we have witnessed a steady but ongoing growth of herds in Sanggang village. This applies to cows (for meat and calves) as well as to goats, sheep and to pigs and chickens that are held in stables located in the village. The development of these herds is also driven by labour investments. Herds are not bought (an initial animal or a sire being the exception); they are developed using the reproductive cycles of the animals, the leftovers of the harvest, and/or by increasing feed and fodder production within the farms. Herds have multiple functions. They represent a type of capital formation: they embody savings. They function as a security blanket, as a fund that might be used when unexpected events demand major spending. They produce manure. And they may sustain income flows (through the selling of new offspring or fattened animals), and they may enliven major events such the Spring Festival.

Households without cattle can obtain their first animals through the Poverty Alleviation Programme. In Sanggang village this programme operates in a peculiar way (as defined by the Village Committee). It was decided that 15 families could get one calf together, which, through breeding should allow each family to have, in the

end, their own animal. However, the villagers 'translated' this in their own way. One family in each beneficiary group 'bought' the calf by paying 100 yuan to each of the remaining 14 families. Ironically, this interpretation of the system means that it is not the poorest families that obtain the calf, although they do receive an extra 100 yuan.

In the early 2000s people like Wu were exceptions to the main social pattern. Most men continued with labour migration until reaching an age of between 50 and 60 years. At the level of the household economy it was necessary to combine agriculture with, as villagers say, 'an economic activity' located elsewhere. Agriculture alone did not provide enough income. Only when the main expenses associated with the children had been paid for (education, house and wedding), could the man retire and dedicate himself solely to farming (Van der Ploeg and Ye, 2010).

What we see at present is that migrant labourers increasingly return at a far younger age. Once they have enough savings, they return to the village *in order to turn farming itself into an 'economic activity'*. This is exemplified by the case of the Wu family, but in Sanggang village there are at the time of writing (2012) some 20 younger men (of between 25 and 50 years of age) who dedicate themselves to farming activities,[20] whilst simultaneously altering these activities. At the same there are no young men of 25 years or less in the village. They are all engaged in labour migration or they are at university. Nearly all the men of over 50 years of age are back in the village again (or are working and living in nearby townships, allowing them to be frequently in the village). This is the 'standard' situation, which emerged from the 1980s onwards and became established in the 1990s and in the first decade of the new century. What is new, however, is that around 5% of men between 25 and 30 years old are back in the village. About 30% of those aged between 30 and 40 have returned, and even more of those between 40 and 50 years are returnees (40%). This suggests a barely noted but nonetheless undeniable acceleration of the return to the village. This earlier return is inspired, we argue, by the reinvention (and consequent restructuring) of farming as an 'economic activity' in everyday village life. It is an economic activity that provides an acceptable income as well as prospects for further development. By reinventing farming these villages are literally shifting part of the money-generating activities from the towns and industries back into the villages.[21]

The Reorganization of Space

The geography of Sanggang village is typical of most mountain villages in rural China. A small river passes through a narrow valley lined with many small fields. The land is fertile and irrigation is nearly always possible. The valley is surrounded by hills. These have been deforested heavily in the past; until recently they were used exclusively for extensive pasturing (mainly goats and sheep). The village is located at the interface of valley and hills. Behind the hills lie the mountains where until recently much extractive mining took place.[22] Mining has extended into the valley: the soil contains layers with iron ore, and sand and stones are extracted for construction activities.

At present, the hills that surround the village are being transformed. The construction of 'ditches' (as they are locally called) is central to this process.[23] This involves creating strips of land along the contour lines. These strips of land are 2–4 metres wide and are separated from each other both in altitude and in distance (see Figure 4). These strips are constructed with mechanical diggers that not only level the land but also dig to a depth of 1.0–1.5 metres in order to loosen and mix the soil. Thus 'ditches' are created in the very hard and impermeable soils and these ditches

Figure 4. Specialization within the framework of the peasant farm.

are filled with churned and loosened soil. This technique has two enormous advantages. It greatly increases the water-retaining capacity of the soil (after the rains the ditches harvest the rain water) and it allows root systems to develop smoothly. An indirect longer-term effect is that this method probably also prevents soil erosion.

The construction of ditches, which is being organized and partially paid for by the Village Committee, allows for an expansion and redefinition of the agricultural frontier.[24] Extensive cattle breeding (based on grazing in the hills) is being reduced whilst fruit tree cultivation is made possible without having to convert the fertile fields in the valley. This coincides with some major macro trends that are increasingly visible in China and that are strongly supported by the state. This creates a paradoxical situation: on the one hand, some marginal lands are being taken out of production (in order to allow for afforestation or widespread anti-erosion measures) while, on the other hand, other parts are strongly upgraded to allow for further intensification. This explains the apparent paradox of decreasing agricultural surfaces and ongoing production increases (see Qu et al., 2009; Heerink et al., 2010).

The ditches are highly suitable for growing persimmon, chestnut and walnut trees. In the first years, when the trees are still young, the land surface might be used simultaneously for e.g. peanut production. This is a clear manifestation of the typical multi-floor farming practices that characterize peasant production all over the world: it allows for highly intensified, but sustainable use of the land.

In Sanggang village, walnut trees start to produce after about five years, with full production achieved after 10 years. At that point a tree will render a minimum of 2–2.5 kg of nuts per tree, but harvests as high as 5 kg per tree are possible. Prices vary for different varieties but are generally more than 30 yuan/kg[25] a tree might produce between 60 and 150 yuan (or far more). There might be up to 35 trees per mu. Hence total GVP per mu could range between 2,100 and 5,250 yuan/mu. This represents an impressive intensification – especially compared to the marginal benefits of grazing in these hills or the average GVP/mu in the valley.

Two hill areas are currently being reconstructed in Sanggang village. In the northern part some 5,000 metres of 'ditches' have been created. These benefit 17 households. They already had the possession rights in this particular part (on average 3 mu per person). Inclusion in the construction scheme is voluntary. The participants pay 3.5 yuan per metre and the Village Committee adds another yuan. For some households the total costs are considerable. These are often paid with money earned in mining, transport and processing of iron ore. Beyond that, most villagers argue that 'two years of peanut production [on the newly opened strips] will pay for the shovel'. The seedlings and the grafting that follows represent additional costs. The Village Committee obtains the seedlings and will sell them to the participants; if some help is obtained from the County, the seedlings might even be distributed for free. The southern part, which is currently being constructed, will benefit another 19 households.

The reorganization of space is an important element in the ongoing intensification of local agriculture.[26] Total production of the village as a whole, as well as the production per household, will increase considerably. Economic benefits are combined with ecological benefits. The erosion and degradation of the hills will be reversed, at least partly. Another effect might be, as villagers argue, that migrants (who will return anyway to the village when getting older) might now return *earlier*. 'Working elsewhere might give you between 10 000 and 20 000 yuan per year. The fruit trees can give you the same or even more. Hence, you might come back earlier. Here you have fresh air and you can be self-sufficient. It is safe, pleasant and your vegetables will not be contaminated.' More generally speaking, the construction of the new 'ditches' is a source of *pride* for all villagers. It is a material expression of an enlarged resource base and, above all, of the capacity to enlarge the resource base through one's own efforts (including cooperation with the Village Committee). It is, as one of the villagers told us, about 'developing new *land*'.

The last element refers to an intriguing feature of local and regional patterns of governance. Village Committees are locally elected (Howell, 1998). They have to prove, after being elected, that they can be useful to the village. The current committee invested first in paving all the roads in the village and then decided that 'something needed to be done for production'. Hence, the decision to construct ditches in the surrounding hills. This is important to the members of the Village Committee: it allows them 'to proudly present the project in Township and County meetings' (since the 1998 floods, central government has strongly encouraged afforestation and anti-erosion projects). The position of the President of the Village Committee is also important. Being the owner of the local iron ore processing unit, he is one of the richest people in the village. This allows him to anticipate (i.e. pre-finance) many of the support measures that will come later. Thus, local development is not stifled by bureaucratic delays elsewhere.

On-farm Processing: Adding More Value

At the end of October or the beginning of November (i.e. *after* the harvest) the fields of Sanggang are again flocked with people. They are working together in teams of 12–15 people and they are engaged in processing sweet potatoes into glass noodles. Glass noodles are a highly valued, high-quality product. They are used in many villages during the Spring Festival to cook special dishes and are also a highly appreciated gift. It is pleasant to observe the making of these glass noodles. It is like theatre:

everyone knows his or her role and the dedicated players, and there is, especially in the beginning, a sense of mystery in the air. The observers do not know exactly what is happening, the involved players do not know, as yet, whether it will all unfold correctly. But you can feel the passion: the willingness to make the best out of it, to create a product that talks about the care and dedication with which it was made. Processing sweet potatoes into glass noodles involves more than 10 steps (every so many 'scenes'), it requires considerable skills and a lot of experience, and it extends over several weeks. Figure 5 provides an impression of one of the many scenes.

When sweet potatoes are sold directly, 1 mu of land might render 1,000–1,500 yuan. When processed into glass noodles (8 jin of very good sweet potatoes are needed to obtain 1 jin of glass noodles) the same mu of land with sweet potatoes might render 4,500–6,000 yuan. When conditions are very good, a plot of 2.6 mu may result in a gross income of 19 500 yuan.

Enlarging the value added per unit of end product (through the production of specialties, on-farm processing, direct marketing, etc.) is not a new phenomenon in China. It could be argued that China's agriculture has always been multifunctional. We note, however, in the villages we are studying that the range and magnitude of such activities is expanding rapidly. At present it embraces activities such as agri-tourism, the cultivation of ornamental trees, free-range chickens, the creation of new market segments in Beijing, the production of walnuts for carving, etc. All these activities are located at a particular interface. On the one hand, there are farmers involved in 'reinventing' agriculture and who are looking eagerly for opportunities to earn more with their multifunctional farm units. On the other hand, there is a rapidly growing middle class looking for distinctive food products[27] and attractive rural services. At this interface new networks emerge, whilst other networks are acquiring new functions and values. The coming and going of migrant labourers, for instance, is used increasingly to transport the locally produced glass noodles to the urban centres and to commercialize them there, sending the earnings back to the

Figure 5. Processing sweet potatoes.

village. If consumers are satisfied they may even use the same network for ordering high-quality glass noodles again the following year.

Conclusions

In this article we have discussed seven mechanisms for agricultural intensification – some are classical (but still highly valid) approaches, others are relatively new. All these mechanisms contribute to, and strengthen, peasant-driven intensification. In both the classical and the newly created mechanisms, *labour* plays a central role and the consolidation or even the enlargement of *autonomy* is strategically important. Labour investments (especially when they imply migration) might indicate difficult and burdensome dependency relations – *but these dependency relations are mostly located in the alien workplace*. Peasants (especially the young ones) engage in such dependency relations *in order to create and enlarge autonomy in the rural workplace to which they will return*. They enter the factory in order to save for their own tractor, which allows them to operate on their own farm or in the wider rural economy as a peasant with an expanded resource base. They do not then have to rent somebody else's tractor to do farm work. They can participate in the wider rural economy (e.g. in transport or trading) using their own means of production.

The same goes for the construction of a beautiful plum orchard or for making ditches. They help materialize autonomy. Involvement in these activities means that the farmers do not have to engage in wage-labour relations elsewhere. They can make their own living and their efforts might well result in increasing their (and/or their children's) wellbeing. Yet they can only do so because they *previously* entered into dependency relations – they did so in order to *actively create* their current autonomy.[28]

The peasant condition has been defined as 'an ongoing struggle for autonomy' (Van der Ploeg, 2008). This struggle can take many forms and it might occur at different levels and in different places. The examples of the Sanggang and Yuangang villages reveal intriguing spatial and temporal dimensions: young peasants enter into relations of dependency and face considerable hardship in faraway places in order to construct enlarged autonomy in their own place in the future. This struggle is one of the main drivers of agricultural intensification. Through the *previous* struggles in faraway places (i.e. through indirect labour investments) and the *current* struggles to get the most out of their land (whilst simultaneously maintaining if not enlarging the resource base through embedded specialization and the construction of ditches) peasants are realizing an ongoing process of intensification – a process of intensification that follows the logic and rationale of the peasantry.

One theoretically important point here is that the two basic elements identified by Chayanov (1966) – drudgery and utility, which together structure much of the dynamics of farming – do not enter into a balance here in one single cycle of agricultural production and at one particular place (the farm). Instead, they are separted geographically and temporally. The drudgery is located in faraway industries and construction sites and experienced when relatively young. Utility follows later and is located in the own village. But the two are neatly tied together. They are brought into equilibrium and balance is achieved. The former makes the latter possible, whilst the latter gives meaning to and justifies the former. Thus, farming, or more generally being nong ming (i.e. peasant), becomes an 'organized flow of activities through time' (Vincent, 1977), a flow that crosses time and space and bridges considerable

distances. Farming cannot be defined, nor understood, as an activity that is just located at one particular place and unfolds solely through an endless repetition of the same routines specified by the agricultural calendar. Instead, farming is increasingly a *network activity* that extends in time and space and that implies complex balances.

The villages that we discussed in this article are far from 'hollow'. Nor do they represent any 'demise of the rural economy'. One of the hidden strengths of the peasant economy of Sanggang and its neighbouring villages is precisely that nearly all peasant families[29] are involved in economic activities outside of the original unit of peasant production.[30] Many work elsewhere in order to be able to make indirect labour investments in farming. Others participate in the opening of 'ditches' in the hills in order to extend the original unit. Some create space for specialized fruit growing that is embedded in the socio-cultural framework of the typical peasant unit of production, and another group is developing herds. Thus, peasant existence increasingly emerges as a patchwork, as an amalgamation of sometimes strikingly different, but cleverly interrelated and mutually reinforcing activities. As argued by Akram-Lodhi and Kay:

> 'It is now more common for rural livelihoods to be constructed from a plethora of fragmentary and insecure sources: petty commodity production in farming, to be sure; but also the sale of temporary and casualized waged labour, both on and off-farm; as well as petty commodity handicraft manufacture, petty merchant trading, the provision of petty services, and a reliance on remittances arising from migration' (2010, p. 179).

It is this patchwork of activities and its associated creation of value added that strongly contributes to the dynamic nature of the 'rural non-farm economy' – it contributes to it and simultaneously shapes the local market that further strengthens the rural non-farm economy (Mohapatra et al., 2006; Zhang et al., 2006; more generally, Haggblade et al., 2007).

Involvement in a multiplicity of activities cannot be understood, as, for example, Kearney (1996) suggests, as the 'disappearance of the peasantry'. It is exactly the other way around (at least in the villages discussed here). Multiple involvement is used actively to *strengthen* the peasant unit. It helps to sustain the intensity of cropping schemes and the intensification of single crops. Multiple involvement equally helps to enlarge the resource base in which peasant farming is grounded. It contributes greatly to the creation of more autonomy (see Van der Ploeg, 2008, p. 23). Working elsewhere also generates the remittances and savings that are used for mechanization (thus allowing for more intensified cropping schemes) and for increased spending (in e.g. inputs such as fertilizer, which allow for a further intensification). It also translates into 'the availability of a lot of money in the village', which makes informal lending (based on reciprocity) far easier than in the past. In turn, the prospects of improved livelihood (related with e.g. walnut production, plum growing, larger herds) implies that migrants will probably return earlier to the villages than in the past (which is already happening to a limited extent), thus enhancing the dynamism of rural and village life.

Notes

1. There often is a strong gender bias in the interpretation and analysis of this situation (see e.g. Gao, 2001; Huang, 2008; Zhou and Song, 2008).

2. Over the last four decades total agricultural production as well as land productivity and total factor productivity have been growing far more than elsewhere (Gulati and Fan, 2007).
3. Phrased differently, the improvement of soil fertility is, in this case, not created through the acquisition of fertilizer or dependent on a monetary transaction.
4. A typical expression of this is maize stored on the roofs of houses.
5. Furthermore, many crops render also non-monetary benefits, normally not calculated as part of GVP (e.g. stalks of maize production used as cattle feed or for heating houses).
6. One mu is 1/15 of a hectare. One yuan is more or less equivalent to € 0.10.
7. Here several other considerations play a contributory role: the maintenance or improvement of soil fertility (some crops are highly demanding, whilst others restore soil fertility), pest and disease suppression, the availability of water, labour, etc., and finally the consumption needs and preferences of the family.
8. A jin equals ½ kilogram.
9. Forestation only implies intensification when it occurs on marginal lands that were only used for extensive grazing or not used at all.
10. For 2012, yields as high as 1500 Jjin/mu were reported.
11. We use the adjective 'embedded' here to stress that specialization does not imply an adieu to peasant farming. It is, instead, embedded in it.
12. With maize a GVP of 560–700 yuan/mu is possible (in this village and with the price levels of 2009 and 2010). The GVP might fluctuate between 600 and 900 yuan per mu in the case of peanuts. If cotton is sown some 1870 yuan/mu (including oil) might be realized (using the 2009 price level).
13. Farmers often are explicit about this: 'Fruit trees provide more benefits than crop production.'
14. Mister Wu, who is now 56 years old, has travelled through large parts of China. He has had many different jobs, including trading. His wife (53) always stayed behind in the village taking care of the scattered plots with vegetable production, maize, etc. The land they are currently cultivating with prunes consists of two parts, each with its own history. The first part was rented some 8 years ago for 830 yuan/year. The Village Committee required an advancement payment for five years. This totalled 4,000 yuan. Another large investment was payment of 16 000 yuan to a specialist who did the grafting. Hence, the total investment was 20 000 yuan. This investment could be paid, according to Wu's calculations, by the first harvest. The second part could be obtained through an initial payment of 30 000 yuan, most of which could be paid with the savings obtained through work elsewhere. The remainder of the money was lent by friends and relatives. Mr. Wu works two months a year in tile making, which renders him 70 yuan/day. This money is earmarked for paying back the loans. All this implies that currently there are no financial costs pressing on the land.
15. Elsewhere, the Wu family has a range of scattered plots of 5–6 mu in total. Here they plant vegetables, soybeans, sweet potatoes, maize and millet. Part of the maize is sold to the 'hog factory' in the village (a plant for intensive pig breeding). The rest is for self-consumption. When asked why they do not plant prunes here as well, they explain that fruit trees bring more (monetary) benefit, and that wheat, rice, flour, or whatever you eat can indeed be bought. However, 'the products you produce yourself are green, they do not contain pesticides, and they are tastier.'
16. When asked about the possibility to further expand the number of fruit trees, the Wus give a straightforward answer: 'This is already sufficient, our daughter is already married and our son already acquired a house… so there is no need for more trees, this is enough.' More generally speaking, production is oriented at: (1) self-provisioning; (2) guaranteeing the required main investments in social life, e.g. weddings and the construction of houses for the next generation; and (3) the creation of reserves that might help to bridge difficult times (diseases, funerals, etc.). Other people, in similar circumstances, might argue: 'We do not prefer a larger land area [than the one available at the moment], because we have limited strength, we can work the land we have now but not more; and hiring people is not convenient because the wages are too high.'
17. A lot of labour is organized through *hu zhu* (mutual help), especially for products (such as sweet potatoes) that need to be planted in a short time period and/or with heavy jobs. 'Without mutual help a farm can hardly function', say the people in the villages. Mutual help is arranged through family bonds, friendship relations, between neighbours and between owners working on adjacent plots. Sometimes the work brigade (from earlier times) remains as the framework for labour exchange. Mutual help is, according to the villagers, especially important for the women. Equally there is considerable interchange of seed material. And finally, lending and borrowing between relatives and between friends also occurs very frequently. Generally, no interest is paid on these loans even though the amounts involved are often considerable. Loans up to 20 000 yuan are no exception. If larger amounts are needed they can be obtained by asking several households to lend money. This practice is explained as follows: 'People are getting rich nowadays, so they can easily lend to others.' Mutual trust and having a good reputation are, of course, essential in this respect.

18. One expression of this is that more than 45 different varieties are planted in this prune orchard alone. There is an ongoing search for the best and most resistant varieties. The family paid 700 yuan to obtain one variety from Japan.
19. Nowadays, all work throughout the year is done by the Wu couple themselves. This also includes difficult tasks such as pruning and grafting. They obtained these skills from the specialized worker who did the first grafting. In general terms the Wus explain that they 'prefer to be independent' (no loans, own savings; no salaried workers, mainly family labour). Being independent gives them 'a sense of dignity and pride'. Although borrowing is not losing face, they prefer to have their own money, rather than borrowing. The same applies to labour: 'We prefer a somewhat smaller piece of land, then we can do all the work ourselves. I myself know what I do; workers maybe don't know, then they do bad pruning, or bad pollination, which can cause considerable damage.' The only exception is the harvest period when they contract 25 workers for two days.
20. They also continue with other economic activities, but these are located within or near the village, allowing them to have a daily involvement in agricultural activities. The total population of Sanggang is 784 people.
21. Comparable data are mentioned in the Ph.D. thesis of Meng Xiandang: within the subgroup of couples in which both man and woman live in the village (as opposed to the subgroup of 'left behind women', whose husband is absent because he is involved in labour migration), 90% of the men is active, in one way or another, in farming and 14% is active solely in farming (Meng, 2014).
22. For environmental and security reasons the licenses for these mines have been cancelled.
23. These 'ditches' differ from terraces, which are locally referred to as 'ladder fields'. The latter are meant for crops (notably rice), the former for trees.
24. There are elements of rebelliousness and endurance to this. It is the second time that fruit trees have been planted here. Several years ago persimmon trees were planted (without preparing the land by digging ditches). At this time the peasants used a programme for forestation that was not intended for fruit trees (the main objective was giving the land back to nature in order to prevent erosion and flash flooding). While this programme was not meant for fruit trees, a translation occurred at the interface between the village and higher echelons. However, quite a few of these persimmon trees died due to drought or because the land could not hold sufficient water.
25. This depends on the variety. The larger nuts, used for handicrafts, command very good prices.
26. Investment in ditches triggered another collective investment, consisting of the construction of a large basin in the riverbed (always containing a lot of water), the installation of an electrical pump, and the construction of a pipeline that goes from the basin to the ditches higher up in the hills. It is to safeguard the newly planted trees in the occasional years when there is no (or far too little) rain and, consequently, no water harvesting in the ditches. This could lead to the destruction of all trees in the new ditches. Again, there is no direct financial return on this investment – however, its value and significance are evident.
27. Food safety being increasingly one of the distinctions they are looking for.
28. The theoretical complexity here is that being a worker or being a peasant are not separate or antagonistic categories. One role flows into the other in order to strengthen it. This condition is also widespread in large parts of the Latin American countryside and often reflected in the self-classification that was widely used in the 1970s and 1980s. People in the countryside then referred to themselves as *nosotros los pobres del campo* [we, the poor people of the countryside]. Tellingly, this was interchangeable with *campesino* [peasant].
29. The telling exceptions are peasant families that lost in one way or another the support of their children (or do not have children) or whose members are physically or mentally disabled.
30. We have described this in a previous article as multiple job holding (Van der Ploeg and Ye, 2010).

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